

TOSHIBA

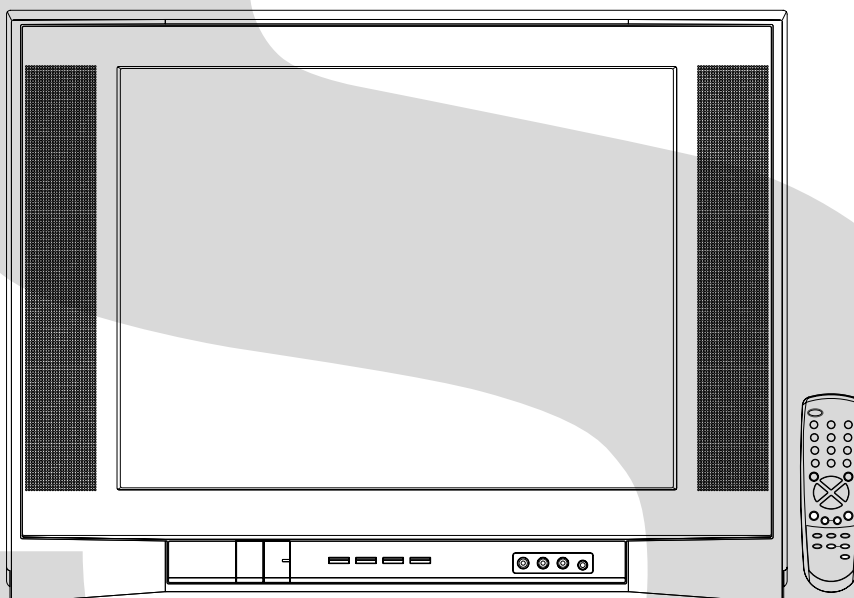
FILE NO. 050-200504
(MFR'S VERSION A)

SERVICE MANUAL

COLOR TELEVISION

20AF45

20AF45C



SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.

Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.

Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.

Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the external exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Headphone jack

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER

The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

IMPORTANT

When you exchange IC and Transistor with a heat sink, apply silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

ABOUT LEAD FREE SOLDER (PbF)

Distinction of PbF PCB:

PCBs (manufactured) using lead free solder will have a PbF printing on the PCB.
(Please refer to figures.)



Caution:

- Pb free solder has a higher melting point than standard solder;
Typically the melting point is 50°F~70°F(30°C~40°C) higher.
Please use a soldering iron with temperature control and adjust it to 650°F ± 20°F (350°C ± 10°C).
In case of using high temperature soldering iron, please be carefull not to heat too long.
- Pb free solder will tend to splash when heated too high (about 1100°F/ 600°C).
- All products with the printed circuit board with PbF printing must be serviced with lead free solder.
When soldering or unsoldering, completely remove all of the solder from the pins or solder area,
and be sure to heat the soldering points with the lead free solder until it melts sufficiently.

Recommendations

Recommended lead free solder composition is Sn-3.0Ag-0.5Cu.

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GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size	20 inch / 508mmV
			CRT Type	Flat
			Magnetic Field BV/BH	+0.45G/0.18G
		Color System		NTSC
		Speaker		2 Speaker
			Position	Front Side
			Size	2 x 4.7 Inch
			Impedance	8 ohm
		Sound Output	MAX	2.5+2.5 W
			10%(Typical)	- W
G-2	Tuning System		NTSC3.58+4.43 /PAL60Hz	No
		Broadcasting System		US System M
		Tuner and	System	1Tuner
		Receive CH	Destination	USA(W/ CATV)
			CH Coverage	2 - 69, 4A, A-5 - A-1, A - I, J - W, W+1 - W+84
		Intermediate Frequency	Picture(FP)	45.75MHz
			Sound(FS)	41.25MHz
			FP-FS	4.50MHz
		Preset CH		No
		Stereo/Dual TV Sound		Yes
G-3	Power	Power Source	AC	120V AC 60Hz
			DC	
		Power Consumption	at AC	105 W at AC 120 V 60 Hz
			Stand by (at AC)	3 W at AC 120 V 60 Hz
			Per Year	-- kWh/Year
		Protector	Power Fuse	Yes
G-4	Regulation		Safety Circuit	Yes
			IC Protector(Micro Fuse)	No
			Safety	UL
			Radiation	FCC
G-5	Temperature		X-Radiation	DHHS
		Operation		+5oC ~ +40oC
		Storage		-20oC ~ +60oC
G-6	Operating Humidity			Less than 80% RH

GENERAL SPECIFICATIONS

G-7	On Screen Display	Menu		Yes		
		Menu Type		Icon		
		Picture		Yes		
		Contrast		Yes		
		Brightness		Yes		
		Color		Yes		
		Tint		Yes		
		Sharpness		Yes		
		Sound		Yes		
		Bass		Yes		
		Treble		Yes		
		Balance		Yes		
		BBE On/Off		No		
		Stable Sound On/Off		Yes		
		Surround On/Off		Yes		
		Set Up		Yes		
		TV/CATV		Yes		
		Auto CH Memory		Yes		
		Add/ Delete		Yes		
		Option		Yes		
		Language		Yes		
		CH Label		Yes		
		Favorite CH		Yes		
		V-Chip		Yes		
		Lock		Yes		
		On/Off Timer		Yes		
		Color Stream DVD/DTV		Yes		
		Control Level		Yes		
		Volume		Yes		
		Brightness		Yes		
		Contrast		Yes		
		Color		Yes		
		Tint		Yes		
		Sharpness		Yes		
		Tuning		No		
		Bass		Yes		
		Treble		Yes		
		Balance		Yes		
		Back Light		No		
		Stereo,Audio Output,SAP		Yes		
		Video		Yes		
		Color Stream		Yes		
		Channel(TV/Cable)		Yes		
		CH Label		Yes		
		Game Timer		Yes		
		Sleep Timer		Yes		
		Sound Mute		Yes		
		V-chip Rating		Yes		
		16: 9		Yes		
G-8	OSD Language			English	French	Spanish
G-9	Clock and Timer	Sleep Timer	Max Time	120 Min		
			Step	10 Min		
		On/Off Timer	Program(On Timer / Off Timer / Clock)			Yes
		Wake Up Timer				No
		Timer Back-up (at Power Off Mode)	more than	--	Min	Sec

GENERAL SPECIFICATIONS

G-10	Remote Control	Unit	RC-GQ
		Glow in Dark Remocon	Yes
		Format	Toshiba
		Remocon Format	Toshiba
		Custom Code	TV:40-BF h
		Power Source	Voltage(D.C) UM size x pcs
			3V UM-4 x 2 pcs
		Total Keys	30 Keys
		Keys	Power
			Yes
		1	Yes
		2	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0	Yes
		100	Yes
		CH Up	Yes
		CH Down	Yes
		Volume Up	Yes
		Volume Down	Yes
		Cap/Text(TV/Caption/Text)	Yes
		1/2(CH1/CH2)	Yes
		TV/Video(TV/AV)	Yes
		CH RTN(Quick View)	Yes
		Sleep	Yes
		RECall(Call)	Yes
		Reset	Yes
		Menu/Enter	Yes
		Mute	Yes
		Exit	Yes
		MTS(Audio Select)	Yes
		Fav.Up	Yes
		Fav.Down	Yes
		16: 9	Yes
		Multi Brand Keys	
		CH Up(VCR)	No
		CH Down(VCR)	No
		Pause/Still	No
		TV/VCR(VCR)	No
		FF	No
		Rew	No
		Rec	No
		Play	No
		Stop	No
		TV	No
		VCR	No
		Cable	No
		DVD	No
		CODE	No
		DVD MENU <	No
		DVD MENU >	No
		DVD CLEAR	No
		TOP MENU	No
		DVD MENU	No

GENERAL SPECIFICATIONS

G-11	Features	Auto Degauss	Yes
		Auto Shut Off	Yes
		Canal+	No
		CATV	Yes
		Anti-theft	No
		Rental	No
		Memory(Last CH)	Yes
		Memory(Last Volume)	Yes
		V-Chip	Yes
		Type	USA, Toshiba Type
		BBE	No
		Auto Search	No
		CH Allocation	No
		SAP	Yes
		Just Clock Function	No
		CH Label	Yes
		VM Circuit	No
		Full OSD	No
		Premiere	No
		Comb Filter	Yes
			2 Lines
		Auto CH Memory	Yes
		Hotel Lock	No
		Closed Caption	Yes
		Stable Sound	Yes
		FBT Leak Test Protect	Yes
		CH Lock	Yes
		Video Lock	Yes
		Game Timer (Max Time:120 Min)	Yes
		Energy Star	No
		Favorite CH	Yes
		Surround	Yes
		16:9 Mode	Yes
G-12	Accessories	Owner's Manual	Language
			W/ Warranty
		Remote Control Unit	Yes
		Rod Antenna	No
			Poles
			Terminal
		Loop Antenna	No
			Terminal
		U/V Mixer	No
		DC Car Cord (Center+)	No
		Guarantee Card	No
		Warning Sheet	No
		Circuit Diagram	No
		Antenna Change Plug	No
		Service Station List	No
		Important Safety Instruction	No
		Dew/AHC Caution Sheet	No
		AC Plug Adapter	No
		Quick Set-up Sheet	No
		Battery	Yes
			UM size x pcs
			OEM Brand
			UM-4 x 2
		AC Cord	No
		AV Cord (2Pin-1Pin)	No
		Registration Card (NDL Card)	Yes
		PTB Sheet	No
		ESP Card	No
		300 ohm to 75 ohm Antenna Adapter	No

GENERAL SPECIFICATIONS

G-13	Interface	Switch	Front	Power	Yes
				System Select	No
		Main Power SW	No		
		Sub Power	No		
		Channel Up	Yes		
		Channel Down	Yes		
		Volume Up	Yes		
		Volume Down	Yes		
		Rear	AC/DC	No	
			TV/CATV Selector	No	
			Degauss	No	
			Main Power SW	No	
		Indicator	Power	Yes(RED)	
			Stand-by	No	
			On Timer	No	
		Terminals	Front	Video Input = VIDEO2	RCA
				Audio Input = VIDEO2	RCA x 2
		Rear	Other Terminal	Head Phone	
			Video Input(Rear1) = VIDEO1	RCA	
			Video Input(Rear2) = VIDEO2	No	
			Audio Input(Rear1) = VIDEO1	RCA x 2	
			Audio Input(Rear2) = VIDEO2	No	
			Video Output	No	
			Audio Output	No	
			Euro Scart	No	
			Color Stream	RCA x 3	
			S Input	Yes	
			Diversity	No	
Ext Speaker	No				
DC Jack 12V(Center +)	No				
VHF/UHF Antenna Input	F Type				
AC Outlet	No				
G-14	Set Size		Approx. W x D x H (mm)		590 x 484 x 446.5
G-15	Weight		Net (Approx.)		23 kg (50.6 lbs)
			Gross (Approx.)		26.5 kg (58.3 lbs)
G-16	Carton	Master Carton		No	
			Content	---- Sets	
			Material	-- /--	
			Dimensions W x D x H(mm)	-- x -- x --	
			Description of Origin	No	
		Gift Box	Material	Double/Brown	
			Dimensions W x D x H(mm)	695 x 575 x 549	
			Description of Origin	Yes	
		Drop Test		Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces	
			Height (cm)	60 (ORION SPEC:46)	
G-17	Cabinet Material	Cabinet	Cabinet Front	PS 94V0 DECABROM	
			Cabinet Rear	PS 94V0 DECABROM	
		PCB	Non-Halogen Demand	No	
			Eyelet Demand	Yes	
			G-18	Environment	Pb-free Soldering
		Parts Specification(Phase3 : based on RoHS)	Yes		

GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size	20 inch / 508mmV
			CRT Type	Flat
			Magnetic Field BV/BH	+0.45G/0.18G
		Color System		NTSC
		Speaker		2 Speaker
			Position	Front Side
			Size	2 x 4.7 Inch
			Impedance	8 ohm
		Sound Output	MAX	2.5+2.5 W
			10%(Typical)	- W
G-2	Tuning System	NTSC3.58+4.43 /PAL60Hz		No
		Broadcasting System		US System M
		Tuner and	System	1Tuner
		Receive CH	Destination	USA(W/ CATV)
			CH Coverage	2 - 69, 4A, A-5 - A-1, A - I, J - W, W+1 - W+84
		Intermediate Frequency	Picture(FP)	45.75MHz
			Sound(FS)	41.25MHz
			FP-FS	4.50MHz
		Preset CH		No
		Stereo/Dual TV Sound		Yes
G-3	Power	Power Source	AC	120V AC 60Hz
			DC	
		Power Consumption	at AC	105 W at AC 120 V 60 Hz
			Stand by (at AC)	3 W at AC 120 V 60 Hz
			Per Year	-- kWh/Year
		Protector	Power Fuse	Yes
G-4	Regulation		Safety Circuit	Yes
			IC Protector(Micro Fuse)	No
			Safety	CSA
			Radiation	IC
G-5	Temperature		X-Radiation	HWC
		Operation		+5oC ~ +40oC
G-6	Operating Humidity	Storage		-20oC ~ +60oC
				Less than 80% RH

GENERAL SPECIFICATIONS

G-7	On Screen Display	Menu		Menu Type			Yes
				Icon			
		Picture					Yes
				Contrast			Yes
				Brightness			Yes
				Color			Yes
				Tint			Yes
				Sharpness			Yes
		Sound					Yes
				Bass			Yes
				Treble			Yes
				Balance			Yes
				BBE On/Off			No
				Stable Sound On/Off			Yes
				Surround On/Off			Yes
		Set Up					Yes
				TV/CATV			Yes
				Auto CH Memory			Yes
				Add/ Delete			Yes
		Option					Yes
				Language			Yes
				CH Label			Yes
				Favorite CH			Yes
				V-Chip			No
				Lock			Yes
				On/Off Timer			Yes
				Color Stream DVD/DTV			Yes
		Control Level					Yes
				Volume			Yes
				Brightness			Yes
				Contrast			Yes
				Color			Yes
				Tint			Yes
				Sharpness			Yes
				Tuning			No
				Bass			Yes
				Treble			Yes
				Balance			Yes
				Back Light			No
				Stereo,Audio Output,SAP			Yes
				Video			Yes
				Color Stream			Yes
				Channel(TV/Cable)			Yes
				CH Label			Yes
				Game Timer			Yes
				Sleep Timer			Yes
				Sound Mute			Yes
				V-chip Rating			No
				16: 9			Yes
G-8	OSD Language				English	French	Spanish
G-9	Clock and Timer	Sleep Timer	Max Time	120 Min			
			Step	10 Min			
		On/Off Timer	Program(On Timer / Off Timer / Clock)		Yes		
		Wake Up Timer		No			
		Timer Back-up (at Power Off Mode)	more than	--	Min	Sec	

GENERAL SPECIFICATIONS

G-10	Remote Control	Unit	RC-GQ
		Glow in Dark Remocon	Yes
		Format	Toshiba
		Remocon Format	Toshiba
		Custom Code	TV:40-BF h
		Power Source	3V
		Voltage(D.C)	UM-4 x 2 pcs
		UM size x pcs	30 Keys
		Total Keys	
		Keys	
		Power	Yes
		1	Yes
		2	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0	Yes
		100	Yes
		CH Up	Yes
		CH Down	Yes
		Volume Up	Yes
		Volume Down	Yes
		Cap/Text(TV/Caption/Text)	Yes
		1/2(CH1/CH2)	Yes
		TV/Video(TV/AV)	Yes
		CH RTN(Quick View)	Yes
		Sleep	Yes
		RECall(Call)	Yes
		Reset	Yes
		Menu/Enter	Yes
		Mute	Yes
		Exit	Yes
		MTS(Audio Select)	Yes
		Fav.Up	Yes
		Fav.Down	Yes
		16: 9	Yes
		Multi Brand Keys	
		CH Up(VCR)	No
		CH Down(VCR)	No
		Pause/Still	No
		TV/VCR(VCR)	No
		FF	No
		Rew	No
		Rec	No
		Play	No
		Stop	No
		TV	No
		VCR	No
		Cable	No
		DVD	No
		CODE	No
		DVD MENU <	No
		DVD MENU >	No
		DVD CLEAR	No
		TOP MENU	No
		DVD MENU	No

GENERAL SPECIFICATIONS

G-11	Features	Auto Degauss	Yes
		Auto Shut Off	Yes
		Canal+	No
		CATV	Yes
		Anti-theft	No
		Rental	No
		Memory(Last CH)	Yes
		Memory(Last Volume)	Yes
		V-Chip	No
		Type	- Type
		BBE	No
		Auto Search	No
		CH Allocation	No
		SAP	Yes
		Just Clock Function	No
		CH Label	Yes
		VM Circuit	No
		Full OSD	No
		Premiere	No
		Comb Filter	Yes
			2 Lines
		Auto CH Memory	Yes
		Hotel Lock	No
		Closed Caption	Yes
		Stable Sound	Yes
		FBT Leak Test Protect	Yes
		CH Lock	Yes
		Video Lock	Yes
		Game Timer (Max Time:120 Min)	Yes
		Energy Star	No
		Favorite CH	Yes
		Surround	Yes
		16:9 Mode	Yes
G-12	Accessories	Owner's Manual	Language
			W/ Warranty
		Remote Control Unit	Yes
		Rod Antenna	No
			Poles
			Terminal
		Loop Antenna	No
			Terminal
		U/V Mixer	No
		DC Car Cord (Center+)	No
		Guarantee Card	No
		Warning Sheet	No
		Circuit Diagram	No
		Antenna Change Plug	No
		Service Station List	No
		Important Safety Instruction	No
		Dew/AHC Caution Sheet	No
		AC Plug Adapter	No
		Quick Set-up Sheet	No
		Battery	Yes
			UM-4 x 2
			No
		AC Cord	No
		AV Cord (2Pin-1Pin)	No
		Registration Card (NDL Card)	No
		PTB Sheet	No
		ESP Card	No
		300 ohm to 75 ohm Antenna Adapter	No

GENERAL SPECIFICATIONS

G-13	Interface	Switch	Front	Power	Yes
				System Select	No
				Main Power SW	No
				Sub Power	No
				Channel Up	Yes
				Channel Down	Yes
				Volume Up	Yes
				Volume Down	Yes
			Rear	AC/DC	No
				TV/CATV Selector	No
				Degauss	No
				Main Power SW	No
		Indicator		Power	Yes(RED)
				Stand-by	No
				On Timer	No
		Terminals	Front	Video Input = VIDEO2	RCA
				Audio Input = VIDEO2	RCA x 2
				Other Terminal	Head Phone
			Rear	Video Input(Rear1) = VIDEO1	RCA
				Video Input(Rear2) = VIDEO2	No
				Audio Input(Rear1) = VIDEO1	RCA x 2
				Audio Input(Rear2) = VIDEO2	No
				Video Output	No
				Audio Output	No
				Euro Scart	No
				Color Stream	RCA x 3
				S Input	Yes
				Diversity	No
Ext Speaker	No				
DC Jack 12V(Center +)	No				
VHF/UHF Antenna Input	F Type				
AC Outlet	No				

G-14	Set Size	Approx.	W x D x H (mm)	590	x	484	x	446.5	
G-15	Weight	Net (Approx.)		23 kg		(50.6 lbs)			
		Gross (Approx.)		26.5 kg		(58.3 lbs)			
G-16	Carton	Master Carton				No			
			Content	----		Sets			
			Material	--		/--			
			Dimensions	W x D x H(mm)	--	x	--	x	--
			Description of Origin			No			
		Gift Box	Material			Double/Brown			
			Dimensions	W x D x H(mm)	695	x	575	x	549
			Description of Origin			Yes			
		Drop Test				Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces			
			Height (cm)			60 (ORION SPEC:46)			
		Container Stuffing		272		Sets/40' container			
G-17	Cabinet Material	Cabinet	Cabinet Front	PS 94V0	DECABROM				
			Cabinet Rear	PS 94V0	DECABROM				
		PCB	Non-Halogen Demand		No				
			Eyelet Demand		Yes				
G-18	Environment	Pb-free Soldering		Yes					
		Parts Specification(Phase3 : based on RoHS)		Yes					

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

- * After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
- * Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap.
(Refer to Fig. 1-1.)

Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground. While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.

A cracking noise will be heard as the voltage is discharged.

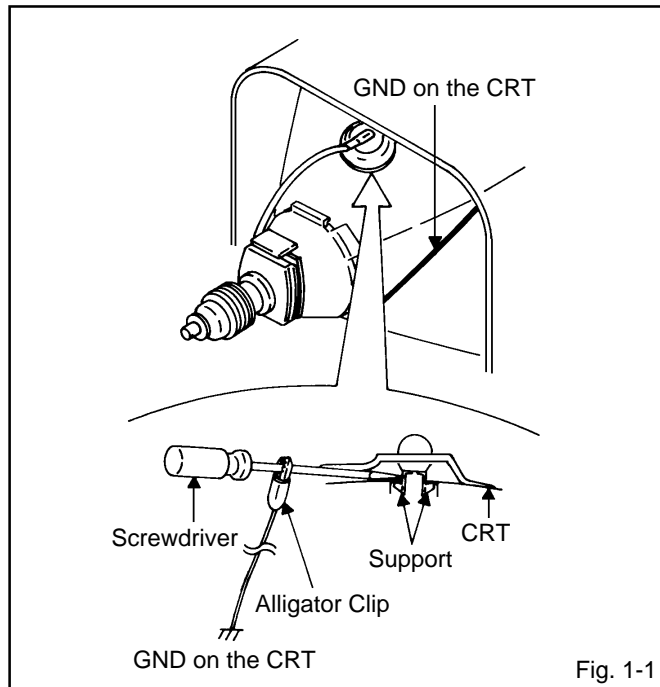


Fig. 1-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support.
(Refer to Fig. 1-2.)

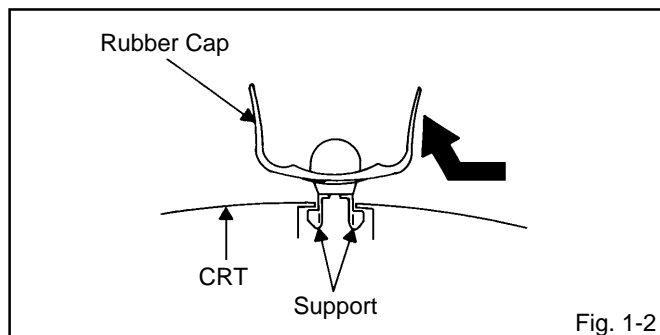


Fig. 1-2

3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. (Refer to Fig. 1-3.)

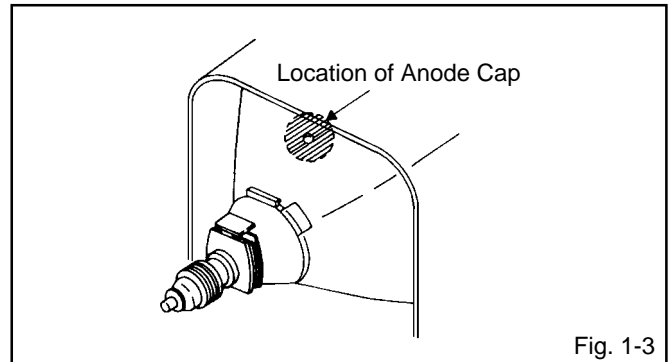


Fig. 1-3

NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. (Refer to Fig. 1-4.)

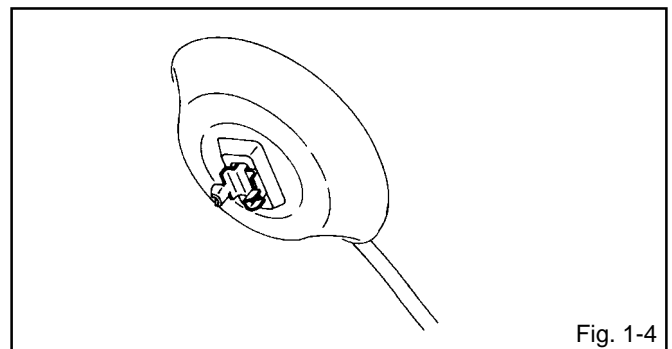


Fig. 1-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in Fig. 1-5.

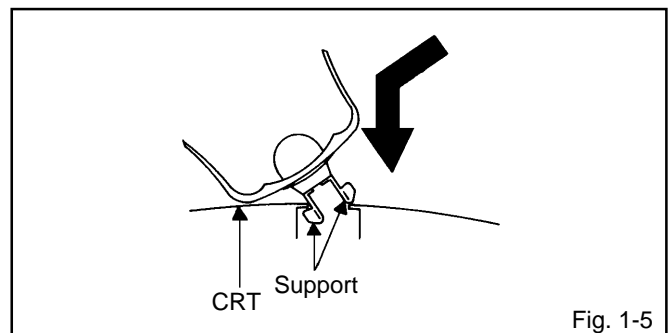


Fig. 1-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

DISASSEMBLY INSTRUCTIONS

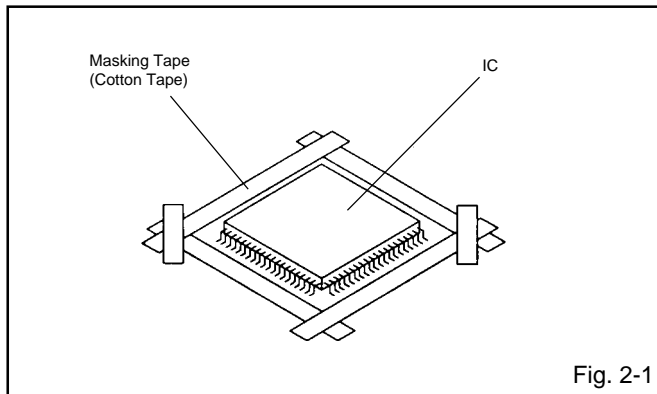
2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. (Refer to Fig. 2-1.)

NOTE

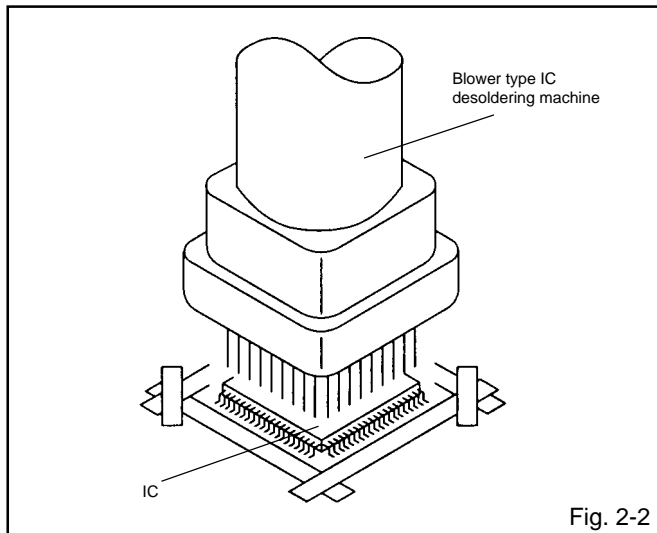
Masking is carried out on all the parts located within 10 mm distance from IC leads.



2. Heat the IC leads using a blower type IC desoldering machine. (Refer to Fig. 2-2.)

NOTE

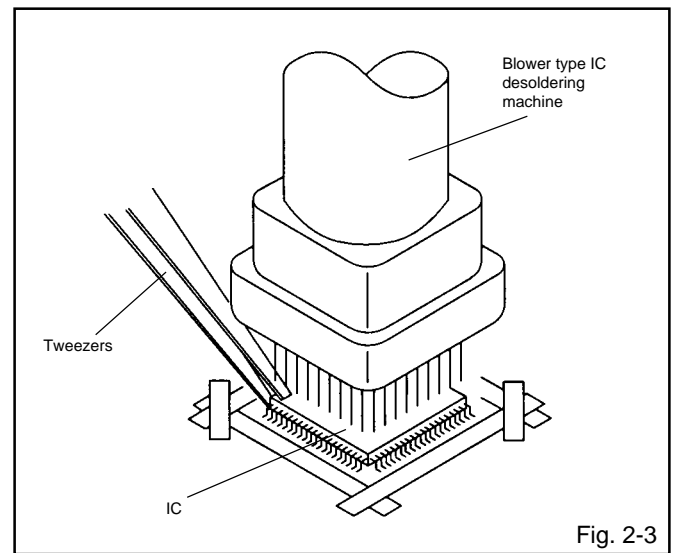
Do not rotate or move the IC back and forth, until IC can move back and forth easily after desoldering the leads completely.



3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. (Refer to Fig. 2-3.)

NOTE

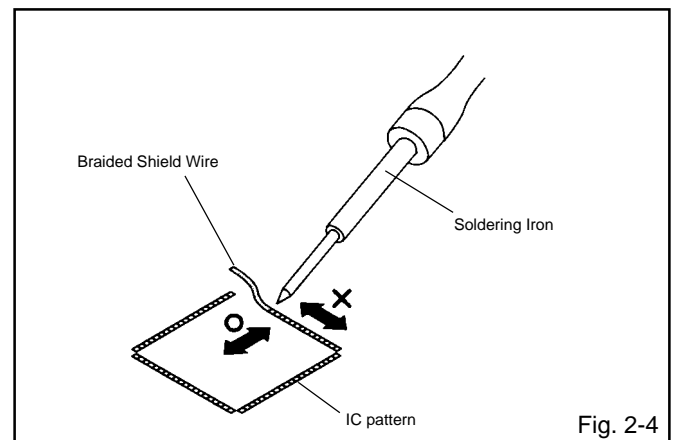
Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.



4. Peel off the Masking Tape.
5. Absorb the solder left on the pattern using the Braided Shield Wire. (Refer to Fig. 2-4.)

NOTE

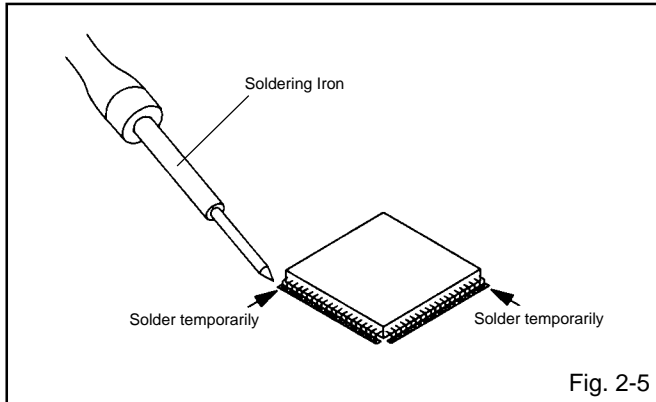
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



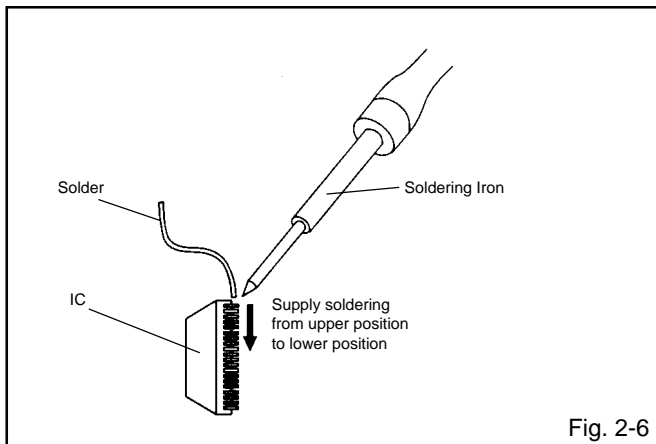
DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. (Refer to Fig. 2-5.)



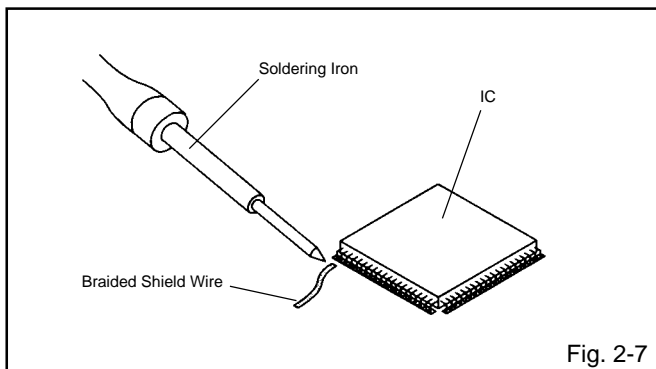
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. (Refer to Fig. 2-6.)



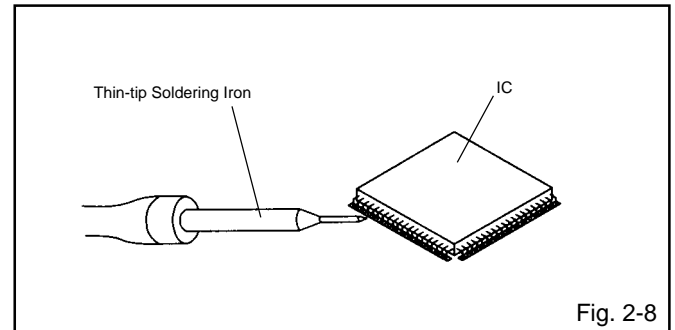
3. Absorb the solder left on the lead using the Braided Shield Wire. (Refer to Fig. 2-7.)

NOTE

Do not absorb the solder to excess.



4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. (Refer to Fig. 2-8.)



5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass. Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

NOTE

When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, always be sure to replace the IC in this case.

SERVICE MODE LIST

This unit is provided with the following SERVICE MODES so you can repair, examine and adjust easily.
To enter to the Service Mode, press both set key and remote control key for more than 2 seconds.

Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	Initialization of factory data. NOTE: Do not use this for normal servicing. If you set factory initialization, the memories are reset such as the channel setting, and the POWER ON total hours.
VOL. (-) MIN	6	POWER ON total hours is displayed on the screen. Refer to the "CONFIRMATION OF HOURS USED". Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

CONFIRMATION OF HOURS USED

POWER ON total hours can be checked on the screen. Total hours are displayed in 16 system of notation.

NOTE: If you set a factory initialization, the total hours is reset to "0".

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second.
3. After the confirmation of using hours, turn off the power.

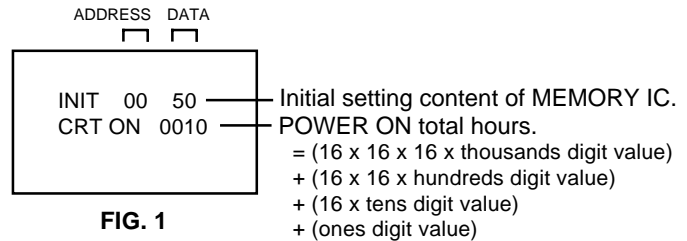


FIG. 1

WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: No need to set data after position INI 1F due to the adjustment value.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	50	E8	0A	45	5E	B3	24	B5	*1	AC	0B	84	40	40	40	7F
10	50	00	00	00	03	00	00	00	3F	0F	0D	E2	94	88	3F	00

*1

INI	USA	CANADA
08	3B	3A

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 2 seconds.
ADDRESS and DATA should appear as FIG 1.
3. ADDRESS is now selected and should "blink". Using the VOL. UP/DOWN button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using VOL. UP/DOWN button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.
After the data input, set to the initializing of shipping.
9. Turn POWER on.
10. Press both VOL. DOWN button on the set and Channel button **(1)** on the remote control for more than 2 seconds.
11. After the finishing of the initializing of shipping, the unit will turn off automatically.
The unit will now have the correct DATA for the new MEMORY IC.

ELECTRICAL ADJUSTMENTS

1. ADJUSTMENT PROCEDURE

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor with a heat sink, apply silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Multi-sound Generator
4. Pattern Generator

On-Screen Display Adjustment

1. In the condition of NO indication on the screen.
Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control for more than 2 seconds to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

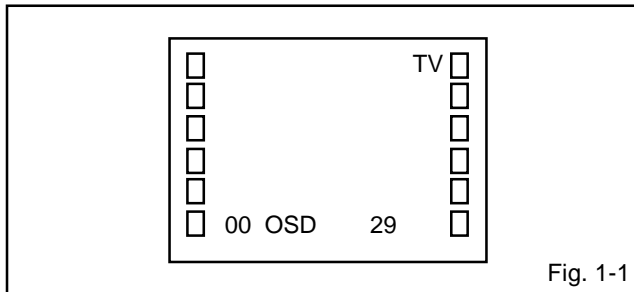


Fig. 1-1

2. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
3. Press the MENU button on the remote control to end the adjustments.

NO. FUNCTION	NO. FUNCTION
00 OSD H	18 CONTRAST MAX
01 CUT OFF	19 CONTRAST CENT
02 H. VCO	20 CONTRAST MIN
03 H. PHASE	21 COLOR MAX
04 AFC GAIN	22 COLOR CENTER
05 V. SHIFT	23 COLOR MIN
06 H. SIZE	24 TINT
07 V. SIZE	25 SHARPNESS
08 V. LINERITY	26 CB DL
09 VS CORRECTION	27 CR DL
10 R DRIVE	28 CB PED
11 B DRIVE	29 CR PED
12 R BIAS	30 PARABOLA
13 G BIAS	31 CORNER
14 B BIAS	32 TRAPWZIUM
15 BRIGHT MAX	33 LEVEL
16 BRIGHT CENT	34 SEPARATION1
17 BRIGHT MIN	35 SEPARATION2

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: CONSTANT VOLTAGE

1. Place the set in AV MODE without signal.
2. Connect the digital voltmeter to the **TP003**.
3. Adjust the **VR502** until the digital voltmeter is $113 \pm 0.5V$.

2-2: CUT OFF

1. Place the set in Aging Test for more than 15 minutes.
2. Set condition is AV MODE without signal.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
5. Adjust the **Screen Volume** until a dim raster is obtained.

2-3: WHITE BALANCE, WHITE BALANCE CS

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set in Aging Test for more than 15 minutes.
2. Receive the gray scale pattern from the Pattern Generator with Brust On.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(12)** on the remote control to select "R. BIAS".
5. Press the CH. UP/DOWN button on the remote control to select the "R. BIAS", "G. BIAS", "B. BIAS", "B. DRIVE" or "R. DRIVE".
6. Adjust the VOL. UP/DOWN button on the remote control to whiten the R. BIAS, G. BIAS, B. BIAS, B. DRIVE and R. DRIVE at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is looked like a white.
8. Press the TV/VIDEO button on the remote control to set to the CS mode.
9. Receive the gray scale pattern from the Pattern Generator with Brust On.
10. If the picture is too much green. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(28)** on the remote control to select "CB PED".
11. Adjust the VOL. UP/DOWN button on the remote control to select the step up.
12. If the picture is too much red. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(29)** on the remote control to select "CR PED".
13. Adjust the VOL. UP/DOWN button on the remote control to select the step down.

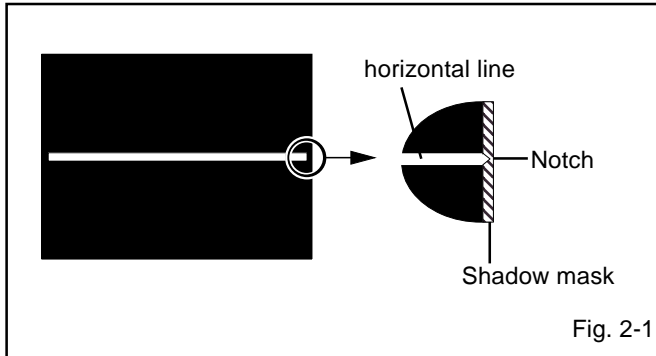
2-4: FOCUS

1. Receive the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

ELECTRICAL ADJUSTMENTS

2-5: VERTICAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Adjust the **VR401** until the horizontal line becomes fit to the notch of the shadow mask.
(Refer to Fig. 2-1)



2-6: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V. SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes $9 \pm 2\%$.

2-7: VERTICAL LINEARITY

NOTE: Adjust after performing adjustments in section 2-6.
After the adjustment of Vertical Linearity, reconfirm the Vertical Position and Vertical Size adjustments.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness, contrast, to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(08)** on the remote control to select "V. LINEARITY".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

2-8: LEVEL

1. Connect the AC voltmeter to **pin 6 of CP101**.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(33)** on the remote control to select "LEVEL".
3. Press the VOL. UP/DOWN button on the remote control until the AC voltmeter is $85 \pm 2\text{mV}$.

2-9: HORIZONTAL PHASE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "H.PHASE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-10: CONTRAST MAX

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(18)** on the remote control to select "CONT. MAX".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "95".
3. Receive a broadcast and check if the picture is normal.
4. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.
5. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 1~3.

2-11: SEPARATION 1, 2

Please do the method (1) or method (2) adjustment.

Method (1)

1. Set the multi-sound signal generator for each different L-ch and R-ch frequency (Ex. L-ch=2KHz, R-ch=400Hz) and receive the RF.
2. Connect the oscilloscope to the **pin 6 and pin 7 of CP101**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(34)** on the remote control to select "SEP 1".
4. Press the VOL. UP/DOWN button on the remote control to adjust it until the audio output wave becomes a fine sine wave.
5. Press the CH UP button once the set to "SEP 2" mode. Then perform the above adjustment 4.

Method (2)

1. Set the multi-sound signal generator L-ch=1KHz, R-ch=Non input and receive the RF.
2. Connect the oscilloscope to the **pin 6 of CP101**.
3. Press the AUDIO SELECT button on the remote control to set to the stereo mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(34)** on the remote control to select "SEP 1".
5. Press the VOL. UP/DOWN button on the remote control to adjust it until the R-ch output becomes minimum.
6. Set the multi-sound signal generator L-ch=Non input, R-ch=1KHz and receive the RF.
7. Connect the oscilloscope to the **pin 7 of CP101**.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(35)** on the remote control to select "SEP 2".
9. Press the VOL. UP/DOWN button on the remote control to adjust it until the L-ch output becomes minimum. The output difference of the between with Filter and without Filter should be more than 25db for both L and R.

ELECTRICAL ADJUSTMENTS

2-12: OSD POSITION

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. (**Refer to Fig. 2-2**)

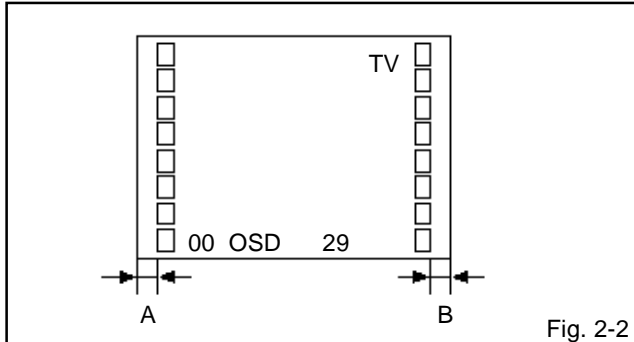


Fig. 2-2

2-13: BRIGHT CENT

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI CENT".
4. Press the VOL. UP/DOWN button on the remote control until the white 10% is starting to be visible.
5. Receive the monoscope pattern. (Audio Video Input)
6. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.
7. Press the TV/VIDEO button on the remote control to set to the CS mode.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI CENT".
9. Press the VOL. UP/DOWN button on the remote control until the brightness step No. becomes "80".

2-14: COLOR CENT

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP022**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "COLOR CENT".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to $120 \pm 5\%$ of the white level. (**Refer to Fig. 2-3**)
7. Receive the video color bar pattern. (Audio Video Input)
8. Place the set in AV mode. Then perform the above adjustments 2~6.
9. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 2~4.
10. Press the VOL. UP/DOWN button on the remote control until the color step No. becomes "66".

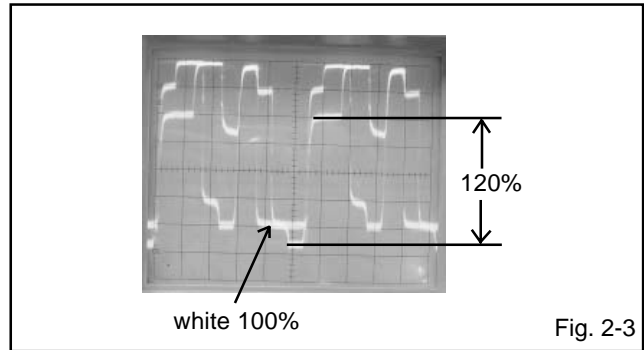


Fig. 2-3

2-15: TINT

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP024**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(24)** on the remote control to select "TINT".
5. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes as straight line. (**Refer to Fig. 2-4**)
6. Receive the video color bar pattern. (Audio Video Input)
7. Place the set in AV mode. Then perform the above adjustments 2~5.
8. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 2~4.
9. Press the VOL. UP/DOWN button on the remote control until the tint step No. becomes "52".

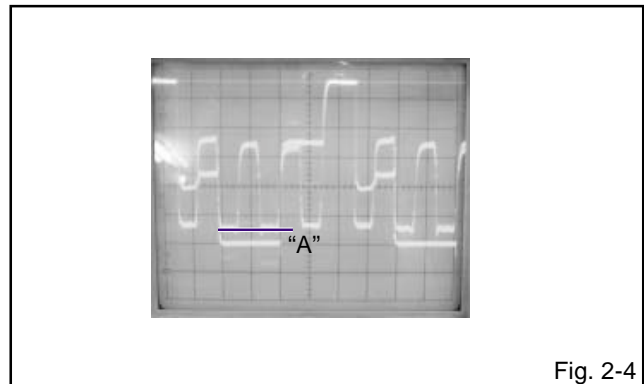


Fig. 2-4

ELECTRICAL ADJUSTMENTS

2-16: Confirmation of Fixed Value (Step No.)

Please check if the fixed values of the each adjustment items are set correctly referring below.

NO.	FUNCTION	RF	AV	CS
02	H.VCO	03	03	03
04	AFC GAIN	07	07	07
05	V.SHIFT	02	02	02
06	H.SIZE	01	01	01
09	VS CORRECTION	34	34	34
15	BRI.MAX	125	125	125
17	BRI.MIN	75	75	75
19	CONT.CENT	50	50	50
20	CONT.MIN	18	18	18
21	COL.MAX	90	90	90
23	COL.MIN	00	00	00
25	SHARPNESS	40	40	40
26	CB DL	00	00	00
27	CR DL	00	00	00
30	PARABOLA	31	31	31
31	CORNER	31	31	31
32	TRAPEZIUM	31	31	31

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue color.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

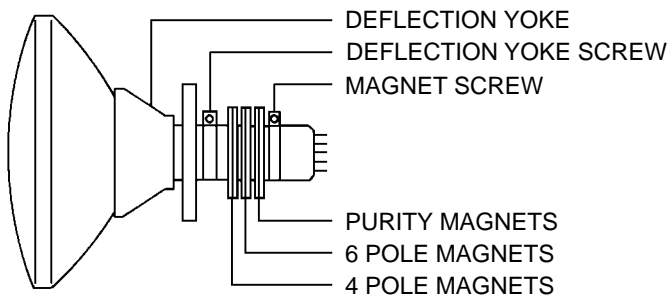


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left.
(Refer to Fig. 3-2-a)
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke.
(Refer to Fig. 3-2-b)

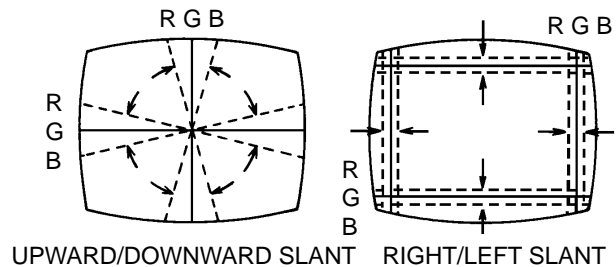
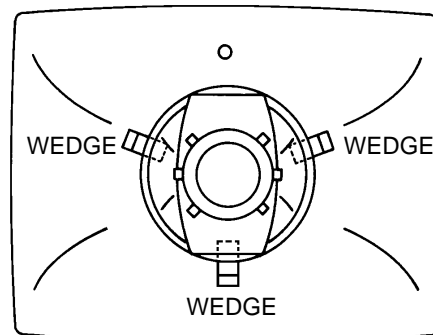


Fig. 3-2-a

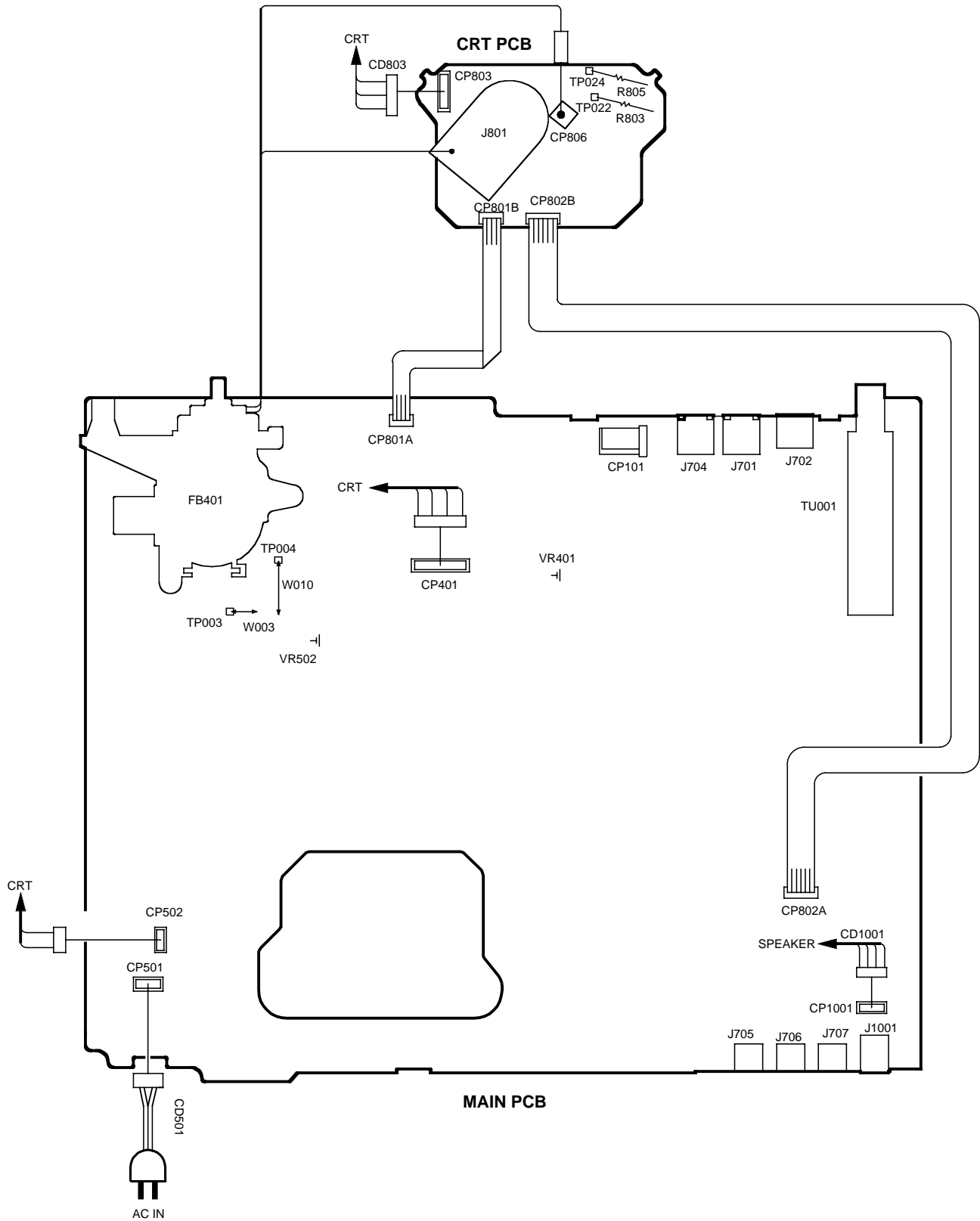


WEDGE POSITION

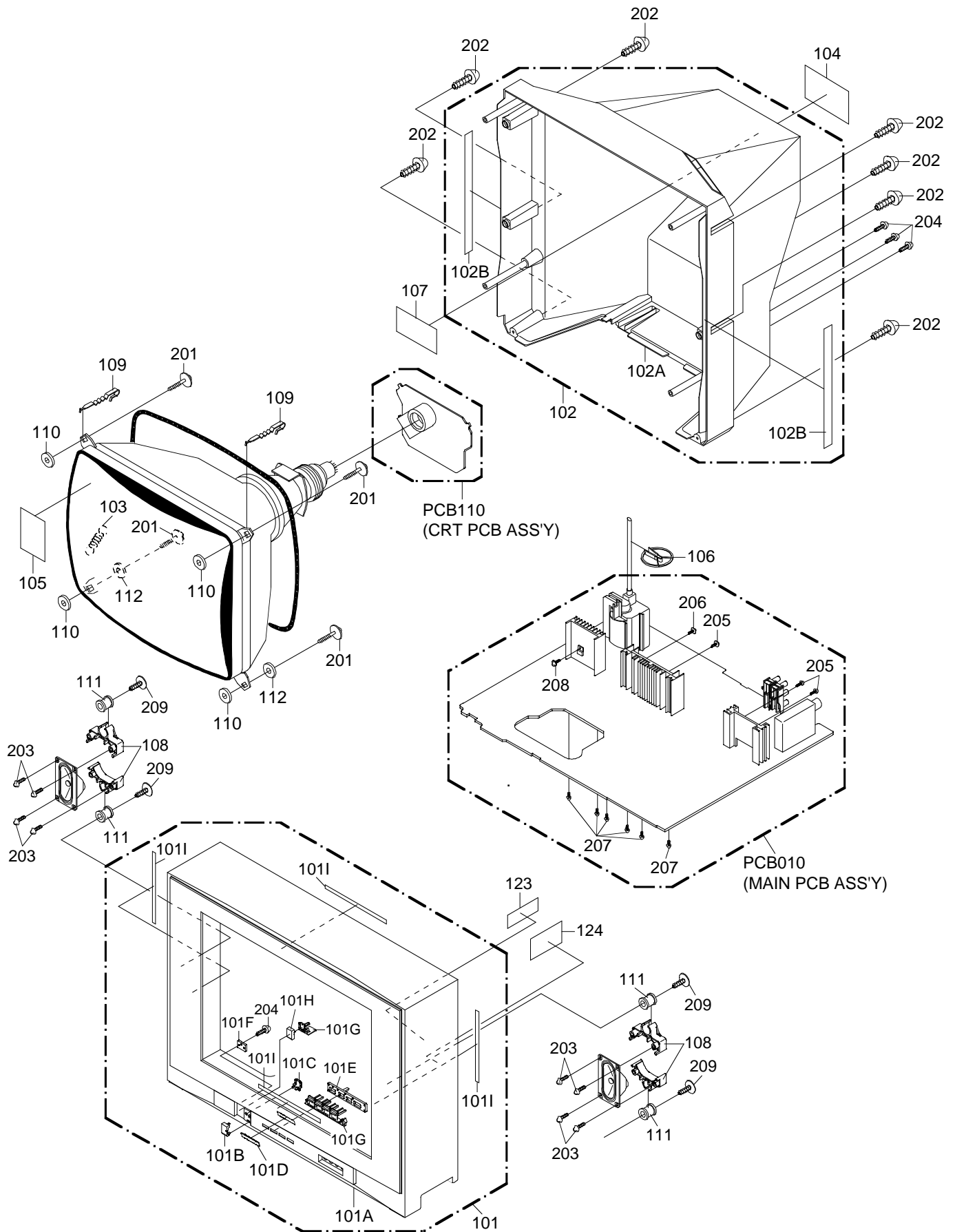
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

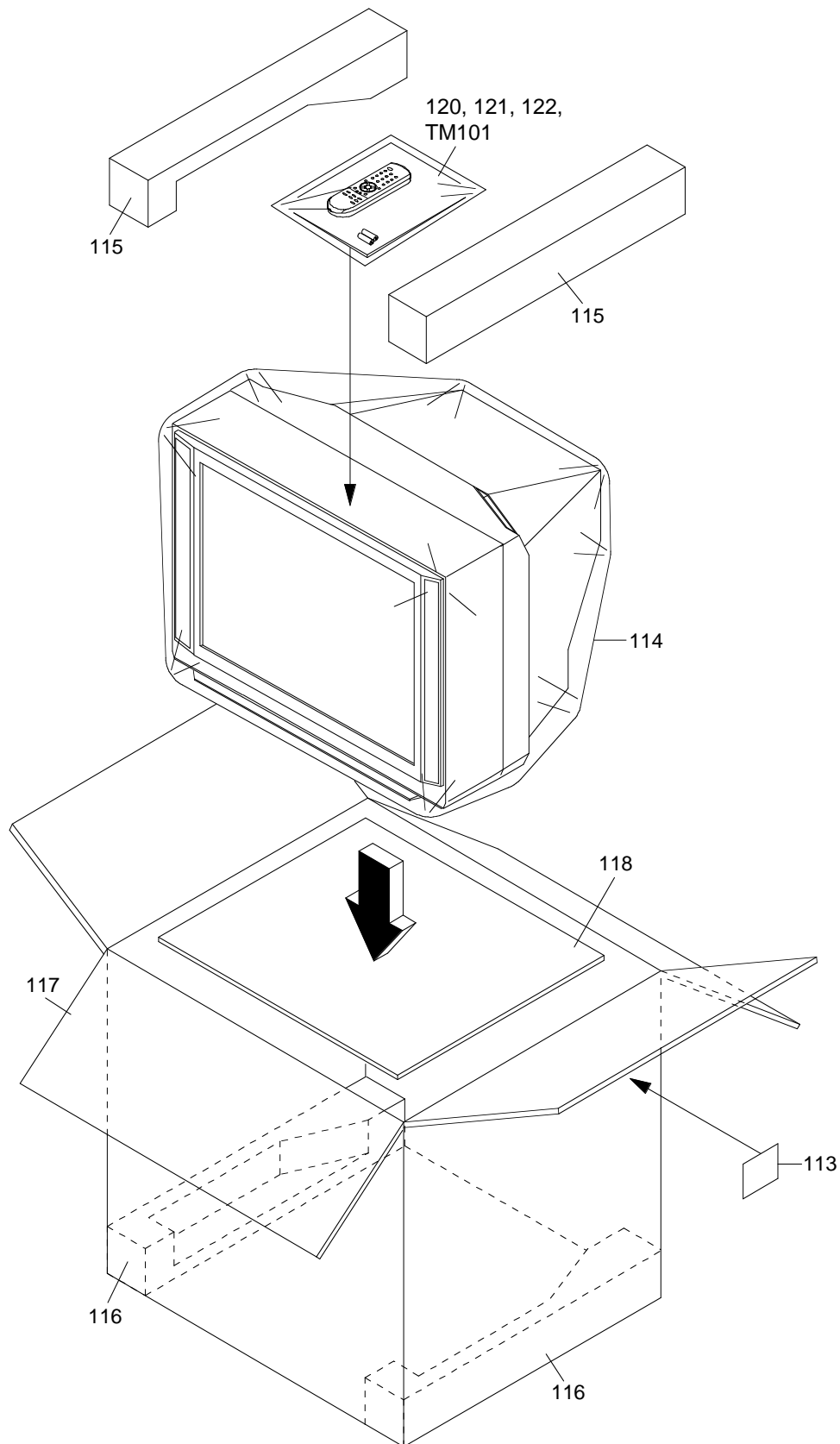
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW (PACKING DIAGRAM)



MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
101	AE006921	7A701A423A	FRONT CABI ASS'Y
101A	AE006922	701WPJD026	CABINET,FRONT
101B	AD302006	711WPA0184	PLATE,FRONT
101C	AD302007	713WPA0263	GLASS,LED
101D	AD302008	7235490036	BADGE,BRAND
101E	AD302009	735WPA0728	STOPPER,BUTTON 1
101F	AD302010	735WPA0732	STOPPER,BUTTON2
101G	AE006923	735WPBB393	BUTTON,FRAME
101H	AE006924	735WPJA853	BUTTON,POWER
101I	AE003069	800WQ0A070	FELT SHEET
102	AE005743	7A702A089A	BACK CABI ASS'Y
102A	AE006225	702WPAA806	CABINET,BACK
102B	AE003072	800WQ0A045	FELT SHEET
103	BZ710660	741WUA0021	SPRING,EARTH
104	AE006227	722549A424	SHEET,RATING
105	AE006228	723000C818	POP LABEL
106	BZ710260	899HV3T000	HOLDER,ANODE WIRE
107	AE006925	726000A105	SHEET,CRT SERVICEMAN
108	AD302015	761WPA0220	HOLDER,SPEAKER
109	BZ710259	762WPA0011	HOLDER,CRT WIRE
110	AD302158	800WR0A002	SHEET,CRT SUPPORT
111	AD300518	801WR00001	DAMPER,SPEAKER
112	AE001107	800WR0A026	SHEET,CRT SUPPORT (D)
113	AE006230	723000C819	SHEET,BAR CODE
114	AE005914	791WHAA114	FILM BAG
115	AD302017	792WHA0432	PACKAGE, TOP
116	AD302018	792WHA0433	PACKAGE,BOTTOM
117	AE006231	793WCDC598	GIFT BOX
118	AE006232	795WCDA011	PAD
119	AE006233	A3S001U975	INSTRUCTION BOOK KIT
120	AE005582	JA4KD200	POLYBAG,INSTRUCTION(RED CAUTION)
121	AE004983	J2D60117A	REGISTRATION CARD
122	AE006234	J3S00121A	INSTRUCTION BOOK(E/S)
201	AE005916	8141J50C5U	SCREW,TAP TITE(P) GW22 5x35
202	AE004847	8117540A6U	SCREW,TAP TITE(B0) TRUSS 4x16
203	AE006235	8117140A2U	SCREW,TAPPING(B0) PAN 4x12
204	AE003528	8110630A0U	SCREW,TAP TITE(P) BRAZIER 3x10
205	AE003531	810763080U	SCREW,TAP TITE(S) BRAZIER 3x8
206	AE003524	8109I30A0U	SCREW,TAP TITE(B) WH7 3x10
207	AE005917	810963080Q	SCREW,TAP TITE(B) BRAZIER 3x8
208	AE005659	8109I3080U	SCREW,TAP TITE(B) WH7 3x8
209	AE005398	8162540A6U	SCREW,TAPPING (BO) WASHER 18

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	AE006006	7A701A320A	FRONT CABI ASS'Y	
101A	AE005742	701WPJC927	CABINET,FRONT	
101B	AD302006	711WPA0184	PLATE,FRONT	
101C	AD302007	713WPA0263	GLASS,LED	
101D	AD302008	7235490036	BADGE,BRAND	
101E	AD302009	735WPA0728	STOPPER,BUTTON 1	
101F	AD302010	735WPA0732	STOPPER,BUTTON2	
101G	AE006223	735WPBB325	BUTTON,FRAME	
101H	AE006224	735WPJA848	BUTTON,POWER	
101I	AE003069	800WQ0A070	FELT SHEET	
102	AE005743	7A702A089A	BACK CABI ASS'Y	
102A	AE006225	702WPAA806	CABINET,BACK	
102B	AE003072	800WQ0A045	FELT SHEET	
103	BZ710660	741WUA0021	SPRING,EARTH	
104	AE006236	722549A448	SHEET,RATING	
105	AE006237	723000C868	POP LABEL	
106	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
107	AE006925	726000A105	SHEET,CRT SERVICEMAN	
108	AD302015	761WPA0220	HOLDER,SPEAKER	
109	BZ710259	762WPA0011	HOLDER,CRT WIRE	
110	AD302158	800WR0A002	SHEET,CRT SUPPORT	
111	AD300518	801WR00001	DAMPER,SPEAKER	
112	AE001107	800WR0A026	SHEET,CRT SUPPORT (D)	
113	AE006238	723000C869	SHEET,BAR CODE	
114	AE005914	791WHAA114	FILM BAG	
115	AD302017	792WHA0432	PACKAGE, TOP	
116	AD302018	792WHA0433	PACKAGE,BOTTOM	
117	AE006239	793WCDC675	GIFT BOX	
118	AE006232	795WCDA011	PAD	
119	AE006240	A3S002U975	INSTRUCTION BOOK KIT	
120	AE006098	JA4KD100	POLYBAG,INSTRUCTION(RED CAUTION)	
122	AE006241	J3S00221A	INSTRUCTION BOOK	
123	AE006242	722000A266	SHEET,HWC	
124	AE006166	722000A267	SHEET,CSA WARNING	
201	AE005916	8141J50C5U	SCREW,TAP TITE(P) GW22	5x35
202	AE004847	8117540A6U	SCREW,TAP TITE(B0) TRUSS	4x16
203	AE006235	8117140A2U	SCREW,TAPPING(B0) PAN	4x12
204	AE003528	8110630A0U	SCREW,TAP TITE(P) BRAZIER	3x10
205	AE003531	810763080U	SCREW,TAP TITE(S) BRAZIER	3x8
206	AE003524	8109I30A0U	SCREW,TAP TITE(B) WH7	3x10
207	AE005917	810963080Q	SCREW,TAP TITE(B) BRAZIER	3x8
208	AE005659	8109I3080U	SCREW,TAP TITE(B) WH7	3x8
209	AE005398	8162540A6U	SCREW,TAPPING (BO) WASHER 18	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
RESISTORS			
△ R402	AE006221	R638U2680J	R,FUSE 68 OHM 1/2W
△ R410	AD301344	R3X18A151J	R,METAL OXIDE 150 OHM 2W
△ R416	AD301593	R002T23R3J	RC 3.3 OHM 1/2W
△ R420	AD301345	R002T22R7J	RC 2.7 OHM 1/2W
△ R426	BZ210030	R4X5T4472F	R,METAL 4.7K OHM 1/4W
R434	AD301972	R5X2CF5R6J	R,CEMENT 5.6 OHM 10W
△ R436	BZ210023	R4X5T4183F	R,METAL 18K OHM 1/4W
△ R438	AE006222	R655812R7J	R,FUSE 2.7 OHM 1W
△ R439	BZ210003	R3K181102J	R,METAL OXIDE 1K OHM 1W
△ R441	BZ210231	R4X5T6153F	R,METAL 15K OHM 1/6W
△ R452	BZ210279	R3X181181J	R,METAL OXIDE 180 OHM 1W
△ R500	BZ210080	R0G3K2275K	RC 2.7M OHM 1/2W
△ R501	AD301596	R5X2AE010J	R,CEMENT 1 OHM 7W
△ R502	BZ210249	R3X28A331J	R,METAL OXIDE 330 OHM 2W
△ R506	BZ210162	R002T4682J	RC 6.8K OHM 1/4W
△ R518	AD301973	R3X28BR22J	R,METAL OXIDE 0.22 OHM 3W
△ R520	BZ210206	R002T2155J	RC 1.5M OHM 1/2W
△ R527	BZ210149	R3X18AR68J	R,METAL OXIDE 0.68 OHM 2W
△ R541	AE005735	R63881R22J	R,FUSE 0.22 OHM 1W
△ R542	BZ210248	R3X181R15J	R,METAL OXIDE 0.15 OHM 1W
△ R602	AD301975	R3X28B120J	R,METAL OXIDE 12 OHM 3W
△ R649	BZ210215	R3X28B100J	R,METAL OXIDE 10 OHM 3W
△ R803	BZ210026	R3X18A153J	R,METAL OXIDE 15K OHM 2W
△ R805	BZ210026	R3X18A153J	R,METAL OXIDE 15K OHM 2W
△ R807	BZ210026	R3X18A153J	R,METAL OXIDE 15K OHM 2W
CAPACITORS			
△ C408	BZ110032	E5EZF3102M	CE 1000 UF 25V
△ C413	AD301977	E0ELF4102M	CE 1000 UF 35V
C418	BZ110136	P4J7F3394J	CMPP 0.39 UF 250V PMS
△ C420	BZ110058	P4N8FJ123H	CMPP 0.012 UF 1.25KV
C425	BZ110202	C0PLRR713K	CC 0.001 UF 2KV R
△ C426	BZ110225	E5EZF0220M	CE 22 UF 250V
△ C430	BZ110195	E02LU8220M	CE 22 UF 100V
△ C501	BZ210176	E02LF3222M	CE 2200 UF 25V
△ C502	BZ110202	C0PLRR713K	CC 0.001 UF 2KV R
△ C503	BZ110202	C0PLRR713K	CC 0.001 UF 2KV R
△ C504	AD301729	E02LU52R2M	CE 2.2 UF 50V
△ C505	BZ110025	P2122B224M	CMP 0.22 UF 275V ECQUL
△ C506	BZ110035	P2122B104M	CMP 0.1 UF 275V ECQUL
△ C507	BZ110012	E51CGC471M	CE 470 UF 200V
△ C508	BZ110222	CD39E0MH3M	CC 0.0022UF 250V
△ C513	AE000950	CD39E0ME3M	CC 0.0015UF 250V
△ C514	BZ210176	E02LF3222M	CE 2200 UF 25V
C517	AE000874	C0PLRR7E3K	CC 0.0015 UF 2KV R
△ C519	AE000950	CD39E0ME3M	CC 0.0015UF 250V
△ C521	AE006083	E61DFB221M	CE 220 UF 160V
△ C527	BZ110119	E02LF2222M	CE 2200 UF 16V
C535	BZ110201	C0PLRR7H3K	CC 0.0022 UF 2KV R
C802	BZ110226	C0JBB07H3K	CC 0.0022UF 2KV B
DIODES			
D001	BZ410037	D97U03301B	DIODE,ZENER MTZJ33B T-77
D104	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D105	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D106	BZ410020	D97U05R11B	DIODE,ZENER MTZJ5.1B T-77
D109	BZ410054	0021721150	LED SLR-342VCT32
D402	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D403	BZ410019	D97U03001B	DIODE,ZENER MTZJ30B T-77
D404	BZ410020	D97U05R11B	DIODE,ZENER MTZJ5.1B T-77
△ D405	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
△ D406	BZ410021	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77
△ D407	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
D410	BZ410019	D97U03001B	DIODE,ZENER MTZJ30B T-77
△ D411	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
D414	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D415	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
△ D501	BZ410062	D2WTRM11C0	DIODE,SILICON RM11C-EIC
△ D502	BZ410062	D2WTRM11C0	DIODE,SILICON RM11C-EIC
△ D503	BZ410062	D2WTRM11C0	DIODE,SILICON RM11C-EIC
△ D504	BZ410062	D2WTRM11C0	DIODE,SILICON RM11C-EIC
△ D505	AE006082	D28F0PRA60	DIODE,RECTIFIER 30PRA60-FC
△ D506	AD300731	D2WXN49370	DIODE,SILICON 1N4937

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
DIODES			
D507	BZ410006	D1VT001330	DIODE,SILICON
D508	BZ410064	D97U03R91B	DIODE,ZENER
D509	AD300671	D97U01801B	DIODE,ZENER
△D510	AD301980	D2CF2016L0	DIODE,SILICON
△D511	AD300731	D2WYN49370	DIODE,SILICON
△D512	BZ410010	D28T21DQN9	DIODE,SCHOTTKY
D513	BZ410006	D1VT001330	DIODE,SILICON
D514	BZ410006	D1VT001330	DIODE,SILICON
D516	BZ410006	D1VT001330	DIODE,SILICON
D517	BZ410006	D1VT001330	DIODE,SILICON
D520	BZ410006	D1VT001330	DIODE,SILICON
△D523	AD300671	D97U01801B	DIODE,ZENER
D524	BZ410006	D1VT001330	DIODE,SILICON
D525	AD300070	D97U01201B	DIODE,ZENER
D528	BZ410021	D97U05R61B	DIODE,ZENER
D601	BZ410006	D1VT001330	DIODE,SILICON
D602	BZ410058	D97U08R21B	DIODE,ZENER
D604	AD300070	D97U01201B	DIODE,ZENER
D605	BZ410006	D1VT001330	DIODE,SILICON
D606	BZ410006	D1VT001330	DIODE,SILICON
D607	BZ410006	D1VT001330	DIODE,SILICON
D608	BZ410043	D2WT011E10	DIODE,SILICON
D701	AD300070	D97U01201B	DIODE,ZENER
D702	AD300070	D97U01201B	DIODE,ZENER
D703	AD300070	D97U01201B	DIODE,ZENER
D704	AD300070	D97U01201B	DIODE,ZENER
D706	AD300070	D97U01201B	DIODE,ZENER
D709	BZ410066	D97U06R21B	DIODE,ZENER
D801	BZ410006	D1VT001330	DIODE,SILICON
D802	BZ410006	D1VT001330	DIODE,SILICON
D803	BZ410006	D1VT001330	DIODE,SILICON
D810	BZ410006	D1VT001330	DIODE,SILICON
D811	BZ410006	D1VT001330	DIODE,SILICON
D812	BZ410006	D1VT001330	DIODE,SILICON
ICS			
IC101	AE006067	I56F07090B	IC
IC199	AE006217	A3S001U015	INIT DATA
IC302	AD301983	I01FF58910	IC
△IC401	AE002783	I03TD804N0	IC
△IC504	BZ410088	0002E00610	PHOTO COUPLER
IC601	AE003906	I06FC1283B	IC
IC902	BZ611068	I01FF58290	IC
△IC1001	AD302184	I0FSP7522N	IC
IC1501	AE006220	I05FEA45FG	IC
IC1502	AD301988	I0UF015010	IC
IC1503	AD301988	I0UF015010	IC
TRANSISTORS			
Q101	BZ510109	TCAA3875SY	TRANSISTOR,SILICON
Q103	BZ510109	TCAA3875SY	TRANSISTOR,SILICON
△Q402	BZ510097	TCAT03227Y	TRANSISTOR,SILICON
△Q405	AE000656	TC1G058850	TRANSISTOR,SILICON
△Q502	BZ510098	T220033260	FET
△Q503	BZ510005	TA3T1371A0	TRANSISTOR,SILICON
Q504	BZ510069	TCATC31980	TRANSISTOR,SILICON
△Q505	BZ510011	TC3T029090	TRANSISTOR,SILICON
△Q507	BZ510069	TCATC31980	TRANSISTOR,SILICON
△Q512	BZ510004	TA3T016240	TRANSISTOR,SILICON
△Q514	BZ510070	TCAT032034	TRANSISTOR,SILICON
Q601	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
Q602	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
Q604	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
Q606	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
Q607	BZ510070	TCAT032034	TRANSISTOR,SILICON
Q611	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
△Q801	BZ510100	TCATC3199Y	TRANSISTOR,SILICON
△Q802	BZ510100	TCATC3199Y	TRANSISTOR,SILICON
△Q803	BZ510100	TCATC3199Y	TRANSISTOR,SILICON
△Q804	BZ510009	TC3F042170	TRANSISTOR,SILICON
△Q805	BZ510009	TC3F042170	TRANSISTOR,SILICON
△Q806	BZ510009	TC3F042170	TRANSISTOR,SILICON
Q1501	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
TRANSISTORS			
Q1502	BZ510109	TCAA3875SY	TRANSISTOR,SILICON
Q1505	BZ510109	TCAA3875SY	TRANSISTOR,SILICON
Q1507	BZ510109	TCAA3875SY	TRANSISTOR,SILICON
COILS & TRANSFORMERS			
L301	BZ310041	02167F101J	COIL
L401	BZ310004	021679472K	COIL
L402	BZ310063	022100027A	COIL,LINEARITY
△L501	BZ310144	029T000097	COIL,LINE FILTER
△L503	BZ310066	028R200024	COIL,DEGAUSS
L901	BZ310041	02167F101J	COIL
L1501	BZ310041	02167F101J	COIL
L1503	BZ310141	02167F100J	COIL
L1504	AD300613	02167F150J	COIL
L1507	BZ310183	021LA6220J	COIL
T401	BZ310172	045013003J	TRANS,HORIZONTAL DRIVE
△T501	AE006212	048135091S	TRANSFORMER,SWITCHING
JACKS			
J701	AE002759	060J431020	RCA JACK
J702	AE006074	063Q700011	JACK
J704	AE002761	060J411032	RCA JACK
J705	AE004756	060J401104	RCA JACK
J706	AE004758	060J401106	RCA JACK
J707	AE004757	060J401105	RCA JACK
△J801	AD301356	066F130020	SOCKET,CATHODE RAY,TUBE
△J1001	AE003431	060J131016	HEADPHONE JACK
SWITCHES			
SW101	BZ612010	0504101T34	SWITCH,TACT
SW102	BZ612010	0504101T34	SWITCH,TACT
SW103	BZ612010	0504101T34	SWITCH,TACT
SW104	BZ612010	0504101T34	SWITCH,TACT
SW105	BZ612010	0504101T34	SWITCH,TACT
VARIABLE RESISTORS			
VR401	BZ210218	V1K63H3BTE	VOLUME,SEMI FIXED
VR502	BZ210101	V1163H4BTC	VOLUME,SEMI FIXED
P.C.BOARD ASSEMBLIES			
PCB010	AE006216	A3S001U010	PCB ASS'Y
PCB110	AE006218	A3S001U110	PCB ASS'Y
MISCELLANEOUS			
B501	BZ310045	024AT03481	CORE,BEADS
B504	BZ310121	024HT03553	CORE,BEADS
B1502	BZ310121	024HT03553	CORE,BEADS
BT001	AE005640	141R004016	BATTERY,MANGAN
BT002	AE005640	141R004016	BATTERY,MANGAN
△CD501	AE006077	1209615904	CORD,AC BUSH
CD801	BZ614446	WCL6836038	FLAT CABLE
CD802	AE000677	WDL6046038	FLAT CABLE
CD803	AE005894	06C3823005	CORD,CONNECTOR
CP101	BZ614102	0694270139	CONNECTOR PCB SIDE
△CP401	AE006075	069X460109	CONNECTOR PCB SIDE
△CP501	BZ614176	069S320419	CONNECTOR PCB SIDE
△CP502	BZ614283	069S420110	CONNECTOR PCB SIDE
CP507	BZ614444	069D01001A	CONNECTOR PCB SIDE
CP508	BZ614444	069D01001A	CONNECTOR PCB SIDE
CP803	BZ614269	069S320010	CONNECTOR PCB SIDE
CP806	BZ614058	069W010010	CONNECTOR PCB SIDE
CD1001	AE006213	06C3146903	CORD,CONNECTOR
CP1001	AD301045	069S140419	CONNECTOR PCB SIDE
CP801A	BZ614276	067U005049	WIRE HOLDER
CP801B	BZ614276	067U005049	WIRE HOLDER
CP802A	BZ614333	067U006049	WIRE HOLDER
CP802B	BZ614333	067U006049	WIRE HOLDER
CUS011	BZ710149	800WFAA008	CUSHION C
EL001	BZ614044	124120301A	EYE LET
EL002	BZ614043	124116281A	EYE LET
△F501	BZ614422	081PC6R305	FUSE
△FB401	AE003174	043220060F	TRANSFORMER,FLYBACK
FH501	AE002634	06710T0009	HOLDER,FUSE
FH502	AE002634	06710T0009	HOLDER,FUSE
OS101	AD301048	0773071001	REMOTE RECEIVER
△RY501	AE006070	0560X20118	RELAY
△SP1001	AD301050	070C457003	SPEAKER

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
			MISCELLANEOUS	
△ SP1002	AD301050	070C457003	SPEAKER	SG05K07BRA
△ TH501	AD302000	D8EE0B1400	DEGAUSS ELEMENT	B59203-S1060-B14
TM101	AE006214	076N0GQ020	TRANSMITTER	RC-GQ020
△ TU001	AE006069	0163300018	RF UNIT	115-V-KA35ARB
△ V801	AE006215	0981210460	CRT W/DY	A51LYZ095X81
X101	AD302002	100CT8R005	CRYSTAL	HC-49/U-S
X602	AD301653	100DT3R531	CRYSTAL	HC-49/U
RESISTOR				
	RC.....	CARBON RESISTOR		
CAPACITORS				
	CC.....	CERAMIC CAPACITOR		
	CE.....	ALUMI ELECTROLYTIC CAPACITOR		
	CP.....	POLYESTER CAPACITOR		
	CPP.....	POLYPROPYLENE CAPACITOR		
	CPL.....	PLASTIC CAPACITOR		
	CMP.....	METAL POLYESTER CAPACITOR		
	CMPL.....	METAL PLASTIC CAPACITOR		
	CMPP.....	METAL POLYPROPYLENE CAPACITOR		

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
RESISTORS			
△ R402	AE006221	R638U2680J	R,FUSE 68 OHM 1/2W
△ R410	AD301344	R3X18A151J	R,METAL OXIDE 150 OHM 2W
△ R416	AD301593	R002T23R3J	RC 3.3 OHM 1/2W
△ R420	AD301345	R002T22R7J	RC 2.7 OHM 1/2W
△ R426	BZ210030	R4X5T4472F	R,METAL 4.7K OHM 1/4W
R434	AD301972	R5X2CF5R6J	R,CEMENT 5.6 OHM 10W
△ R436	BZ210023	R4X5T4183F	R,METAL 18K OHM 1/4W
△ R438	AE006222	R655812R7J	R,FUSE 2.7 OHM 1W
△ R439	BZ210003	R3K181102J	R,METAL OXIDE 1K OHM 1W
△ R441	BZ210231	R4X5T6153F	R,METAL 15K OHM 1/6W
△ R452	BZ210279	R3X181181J	R,METAL OXIDE 180 OHM 1W
△ R500	BZ210080	R0G3K2275K	RC 2.7M OHM 1/2W
△ R501	AD301596	R5X2AE010J	R,CEMENT 1 OHM 7W
△ R502	BZ210249	R3X28A331J	R,METAL OXIDE 330 OHM 2W
△ R506	BZ210162	R002T4682J	RC 6.8K OHM 1/4W
△ R518	AD301973	R3X28BR22J	R,METAL OXIDE 0.22 OHM 3W
△ R520	BZ210206	R002T2155J	RC 1.5M OHM 1/2W
△ R527	BZ210149	R3X18AR68J	R,METAL OXIDE 0.68 OHM 2W
△ R541	AE005735	R63881R22J	R,FUSE 0.22 OHM 1W
△ R542	BZ210248	R3X181R15J	R,METAL OXIDE 0.15 OHM 1W
△ R602	AD301975	R3X28B120J	R,METAL OXIDE 12 OHM 3W
△ R649	BZ210215	R3X28B100J	R,METAL OXIDE 10 OHM 3W
△ R803	BZ210026	R3X18A153J	R,METAL OXIDE 15K OHM 2W
△ R805	BZ210026	R3X18A153J	R,METAL OXIDE 15K OHM 2W
△ R807	BZ210026	R3X18A153J	R,METAL OXIDE 15K OHM 2W
CAPACITORS			
△ C408	BZ110032	E5EZF3102M	CE 1000 UF 25V
△ C413	AD301977	E0ELF4102M	CE 1000 UF 35V
C418	BZ110136	P4J7F3394J	CMPP 0.39 UF 250V PMS
△ C420	BZ110058	P4N8FJ123H	CMPP 0.012 UF 1.25KV
C425	BZ110202	C0PLRR713K	CC 0.001 UF 2KV R
△ C426	BZ110225	E5EZF0220M	CE 22 UF 250V
△ C430	BZ110195	E02LU8220M	CE 22 UF 100V
△ C501	BZ210176	E02LF3222M	CE 2200 UF 25V
△ C502	BZ110202	C0PLRR713K	CC 0.001 UF 2KV R
△ C503	BZ110202	C0PLRR713K	CC 0.001 UF 2KV R
△ C504	AD301729	E02LU52R2M	CE 2.2 UF 50V
△ C505	BZ110025	P2122B224M	CMP 0.22 UF 275V ECQUL
△ C506	BZ110035	P2122B104M	CMP 0.1 UF 275V ECQUL
△ C507	BZ110012	E51CGC471M	CE 470 UF 200V
△ C508	BZ110222	CD39E0MH3M	CC 0.0022UF 250V
△ C513	AE000950	CD39E0ME3M	CC 0.0015UF 250V
△ C514	BZ210176	E02LF3222M	CE 2200 UF 25V
C517	AE000874	C0PLRR7E3K	CC 0.0015 UF 2KV R
△ C519	AE000950	CD39E0ME3M	CC 0.0015UF 250V
△ C521	AE006083	E61DFB221M	CE 220 UF 160V
△ C527	BZ110119	E02LF2222M	CE 2200 UF 16V
C535	BZ110201	C0PLRR7H3K	CC 0.0022 UF 2KV R
C802	BZ110226	C0JBB07H3K	CC 0.0022UF 2KV B
DIODES			
D001	BZ410037	D97U03301B	DIODE,ZENER MTZJ33B T-77
D104	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D105	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D106	BZ410020	D97U05R11B	DIODE,ZENER MTZJ5.1B T-77
D109	BZ410054	0021721150	LED SLR-342VCT32
D402	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D403	BZ410019	D97U03001B	DIODE,ZENER MTZJ30B T-77
D404	BZ410020	D97U05R11B	DIODE,ZENER MTZJ5.1B T-77
△ D405	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
△ D406	BZ410021	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77
△ D407	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
D410	BZ410019	D97U03001B	DIODE,ZENER MTZJ30B T-77
△ D411	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
D414	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D415	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
△ D501	BZ410062	D2WTRM11C0	DIODE,SILICON RM11C-EIC
△ D502	BZ410062	D2WTRM11C0	DIODE,SILICON RM11C-EIC
△ D503	BZ410062	D2WTRM11C0	DIODE,SILICON RM11C-EIC
△ D504	BZ410062	D2WTRM11C0	DIODE,SILICON RM11C-EIC
△ D505	AE006082	D28F0PRA60	DIODE,RECTIFIER 30PRA60-FC
△ D506	AD300731	D2WXN49370	DIODE,SILICON 1N4937

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
DIODES			
D507	BZ410006	D1VT001330	DIODE,SILICON
D508	BZ410064	D97U03R91B	DIODE,ZENER
D509	AD300671	D97U01801B	DIODE,ZENER
△D510	AD301980	D2CF2016L0	DIODE,SILICON
△D511	AD300731	D2WXN49370	DIODE,SILICON
△D512	BZ410010	D28T21DQN9	DIODE,SCHOTTKY
D513	BZ410006	D1VT001330	DIODE,SILICON
D514	BZ410006	D1VT001330	DIODE,SILICON
D516	BZ410006	D1VT001330	DIODE,SILICON
D517	BZ410006	D1VT001330	DIODE,SILICON
D520	BZ410006	D1VT001330	DIODE,SILICON
△D523	AD300671	D97U01801B	DIODE,ZENER
D524	BZ410006	D1VT001330	DIODE,SILICON
D525	AD300070	D97U01201B	DIODE,ZENER
D528	BZ410021	D97U05R61B	DIODE,ZENER
D601	BZ410006	D1VT001330	DIODE,SILICON
D602	BZ410058	D97U08R21B	DIODE,ZENER
D604	AD300070	D97U01201B	DIODE,ZENER
D605	BZ410006	D1VT001330	DIODE,SILICON
D606	BZ410006	D1VT001330	DIODE,SILICON
D607	BZ410006	D1VT001330	DIODE,SILICON
D608	BZ410043	D2WT011E10	DIODE,SILICON
D701	AD300070	D97U01201B	DIODE,ZENER
D702	AD300070	D97U01201B	DIODE,ZENER
D703	AD300070	D97U01201B	DIODE,ZENER
D704	AD300070	D97U01201B	DIODE,ZENER
D706	AD300070	D97U01201B	DIODE,ZENER
D709	BZ410066	D97U06R21B	DIODE,ZENER
D801	BZ410006	D1VT001330	DIODE,SILICON
D802	BZ410006	D1VT001330	DIODE,SILICON
D803	BZ410006	D1VT001330	DIODE,SILICON
D810	BZ410006	D1VT001330	DIODE,SILICON
D811	BZ410006	D1VT001330	DIODE,SILICON
D812	BZ410006	D1VT001330	DIODE,SILICON
ICS			
IC101	AE006067	I56F07090B	IC
IC199	AE006896	A3S002U015	INIT DATA
IC302	AD301983	I01FF58910	IC
△IC401	AE002783	I03TD804N0	IC
△IC504	BZ410088	0002E00610	PHOTO COUPLER
IC601	AE003906	I06FC1283B	IC
IC902	BZ611068	I01FF58290	IC
△IC1001	AD302184	I0FSP7522N	IC
IC1501	AE006220	I05FEA45FG	IC
IC1502	AD301988	I0UF015010	IC
IC1503	AD301988	I0UF015010	IC
TRANSISTORS			
Q101	BZ510109	TCAA3875SY	TRANSISTOR,SILICON
Q103	BZ510109	TCAA3875SY	TRANSISTOR,SILICON
△Q402	BZ510097	TCAT03227Y	TRANSISTOR,SILICON
△Q405	AE000656	TC1G058850	TRANSISTOR,SILICON
△Q502	BZ510098	T220033260	FET
△Q503	BZ510005	TA3T1371A0	TRANSISTOR,SILICON
Q504	BZ510069	TCATC31980	TRANSISTOR,SILICON
△Q505	BZ510011	TC3T029090	TRANSISTOR,SILICON
△Q507	BZ510069	TCATC31980	TRANSISTOR,SILICON
△Q512	BZ510004	TA3T016240	TRANSISTOR,SILICON
△Q514	BZ510070	TCAT032034	TRANSISTOR,SILICON
Q601	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
Q602	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
Q604	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
Q606	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
Q607	BZ510070	TCAT032034	TRANSISTOR,SILICON
Q611	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
△Q801	BZ510100	TCATC3199Y	TRANSISTOR,SILICON
△Q802	BZ510100	TCATC3199Y	TRANSISTOR,SILICON
△Q803	BZ510100	TCATC3199Y	TRANSISTOR,SILICON
△Q804	BZ510009	TC3F042170	TRANSISTOR,SILICON
△Q805	BZ510009	TC3F042170	TRANSISTOR,SILICON
△Q806	BZ510009	TC3F042170	TRANSISTOR,SILICON
Q1501	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON
			1SS133T-77
			MTZJ3.9B T-77
			MTZJ18B T-77
			FE201-6L49
			1N4937
			21DQ09N-TA2B1
			1SS133T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			MTZJ18B T-77
			1SS133T-77
			MTZJ12B T-77
			MTZJ5.6B T-77
			1SS133T-77
			MTZJ8.2B T-77
			MTZJ12B T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			11E1-EIC
			MTZJ12B T-77
			MTZJ12B T-77
			MTZJ12B T-77
			MTZJ12B T-77
			MTZJ12B T-77
			MTZJ6.2B T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			1SS133T-77
			OEC7090B
			BR24L16FJ-WE2
			AN5891SA-E1V
			LA78040N-E
			LTV-817M-VB
			M61283BFP
			AN5829S
			AN7522N
			TC90A45FG
			MM1501XNRE
			MM1501XNRE
			KTC3875S_Y_RTK
			KTC3875S_Y_RTK
			KTC3227_Y-AT
			2SC5885
			2SK3326(2)
			2SA1371(D,E)-AE
			KTC3198-AT(Y,GR)
			2SC2909(S,T)-AA
			KTC3198-AT(Y,GR)
			2SA1624-AA
			KTC3203_Y-AT
			KTC3209_Y-AT
			KTC3209_Y-AT
			KTC3209_Y-AT
			KTC3209_Y-AT
			KTC3203_Y-AT
			KTC3209_Y-AT
			KTC3199_Y-AT
			KTC3199_Y-AT
			KTC3199_Y-AT
			2SC4217(D,E)-RAC
			2SC4217(D,E)-RAC
			2SC4217(D,E)-RAC
			2SA1037AKT146R,S

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
TRANSISTORS			
Q1502	BZ510109	TCAA3875SY	TRANSISTOR,SILICON
Q1505	BZ510109	TCAA3875SY	TRANSISTOR,SILICON
Q1507	BZ510109	TCAA3875SY	TRANSISTOR,SILICON
COILS & TRANSFORMERS			
L301	BZ310041	02167F101J	COIL
L401	BZ310004	021679472K	COIL
L402	BZ310063	022100027A	COIL,LINEARITY
△L501	BZ310144	029T000097	COIL,LINE FILTER
△L503	BZ310066	028R200024	COIL,DEGAUSS
L901	BZ310041	02167F101J	COIL
L1501	BZ310041	02167F101J	COIL
L1503	BZ310141	02167F100J	COIL
L1504	AD300613	02167F150J	COIL
L1507	BZ310183	021LA6220J	COIL
T401	BZ310172	045013003J	TRANS,HORIZONTAL DRIVE
△T501	AE006212	048135091S	TRANSFORMER,SWITCHING
JACKS			
J701	AE002759	060J431020	RCA JACK
J702	AE006074	063Q700011	JACK
J704	AE002761	060J411032	RCA JACK
J705	AE004756	060J401104	RCA JACK
J706	AE004758	060J401106	RCA JACK
J707	AE004757	060J401105	RCA JACK
△J801	AD301356	066F130020	SOCKET,CATHODE RAY,TUBE
△J1001	AE003431	060J131016	HEADPHONE JACK
SWITCHES			
SW101	BZ612010	0504101T34	SWITCH,TACT
SW102	BZ612010	0504101T34	SWITCH,TACT
SW103	BZ612010	0504101T34	SWITCH,TACT
SW104	BZ612010	0504101T34	SWITCH,TACT
SW105	BZ612010	0504101T34	SWITCH,TACT
VARIABLE RESISTORS			
VR401	BZ210218	V1K63H3BTE	VOLUME,SEMI FIXED
VR502	BZ210101	V1163H4BTC	VOLUME,SEMI FIXED
P.C.BOARD ASSEMBLIES			
PCB010	AE006897	A3S002U010	PCB ASS'Y
PCB110	AE006219	A3S002U110	PCB ASS'Y
MISCELLANEOUS			
B501	BZ310045	024AT03481	CORE,BEADS
B504	BZ310121	024HT03553	CORE,BEADS
B1502	BZ310121	024HT03553	CORE,BEADS
BT001	AE005640	141R004016	BATTERY,MANGAN
BT002	AE005640	141R004016	BATTERY,MANGAN
△CD501	AE006077	1209615904	CORD,AC BUSH
CD801	BZ614446	WCL6836038	FLAT CABLE
CD802	AE000677	WDL6046038	FLAT CABLE
CD803	AE005894	06C3823005	CORD,CONNECTOR
CP101	BZ614102	0694270139	CONNECTOR PCB SIDE
△CP401	AE006075	069X460109	CONNECTOR PCB SIDE
△CP501	BZ614176	069S320419	CONNECTOR PCB SIDE
△CP502	BZ614283	069S420110	CONNECTOR PCB SIDE
CP507	BZ614444	069D01001A	CONNECTOR PCB SIDE
CP508	BZ614444	069D01001A	CONNECTOR PCB SIDE
CP803	BZ614269	069S320010	CONNECTOR PCB SIDE
CP806	BZ614058	069W010010	CONNECTOR PCB SIDE
CD1001	AE006213	06C3146903	CORD CONNECTOR
CP1001	AD301045	069S140419	CONNECTOR PCB SIDE
CP801A	BZ614276	067U005049	WIRE HOLDER
CP801B	BZ614276	067U005049	WIRE HOLDER
CP802A	BZ614333	067U006049	WIRE HOLDER
CP802B	BZ614333	067U006049	WIRE HOLDER
CUS011	BZ710149	800WFAA008	CUSHION C
EL001	BZ614044	124120301A	EYE LET
EL002	BZ614043	124116281A	EYE LET
△F501	BZ614422	081PC6R305	FUSE
△FB401	AE003174	043220060F	TRANSFORMER,FLYBACK
FH501	AE002634	06710T0009	HOLDER,FUSE
FH502	AE002634	06710T0009	HOLDER,FUSE
OS101	AD301048	0773071001	REMOTE RECEIVER
△RY501	AE006070	0560X20118	RELAY
△SP1001	AD301050	070C457003	SPEAKER

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
MISCELLANEOUS				
△SP1002	AD301050	070C457003	SPEAKER	SG05K07BRA
△TH501	AD302000	D8EE0B1400	DEGAUSS ELEMENT	B59203-S1060-B14
TM101	AE006214	076N0GQ020	TRANSMITTER	RC-GQ020
△TU001	AE006069	0163300018	RF UNIT	115-V-KA35ARB
△V801	AE006215	0981210460	CRT W/DY	A51LYZ095X81
X101	AD302002	100CT8R005	CRYSTAL	HC-49/U-S
X602	AD301653	100DT3R531	CRYSTAL	HC-49/U

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

CC..... CERAMIC CAPACITOR
CE..... ALUMI ELECTROLYTIC CAPACITOR
CP..... POLYESTER CAPACITOR
CPP..... POLYPROPYLENE CAPACITOR
CPL..... PLASTIC CAPACITOR
CMP..... METAL POLYESTER CAPACITOR
CMPL..... METAL PLASTIC CAPACITOR
CMPP..... METAL POLYPROPYLENE CAPACITOR

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN